



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/725,993	12/03/2003	Ryosuke Usui	65933-061	5205
20277	7590	09/02/2005	EXAMINER	
MCDERMOTT WILL & EMERY LLP 600 13TH STREET, N.W. WASHINGTON, DC 20005-3096			LAM, CATHY FONG FONG	
			ART UNIT	PAPER NUMBER
			1775	

DATE MAILED: 09/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/725,993

Applicant(s)

USUI ET AL.

Examiner

Cathy Lam

Art Unit

1775

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 7-16 and 22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 17-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12-03-2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

In view of the response filed on June 23, 2005, Applicant elected claims 1-6 & 17-21 for examination.

Election/Restrictions

1. Applicant's election of group I (ie. claims 1-6 & 17-21) in the reply filed on June 23, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. This application contains claims 7-16 and 22 are drawn to an invention nonelected with traverse in Paper No. filed on June 23, 2005. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a) because they fail to show **402** as described on page 25 line 31 in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must

be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims.

Also, in Fig. 5C number **406** is not defined in the specification.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 3-4, 6, 17, 19-21 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Zussman (US 4601944).

Zussman teaches a multilayer printed wiring board comprised of a plurality of prepregs and copper foils (col 6 L 13-21). The examiner takes the position that the prepregs are equivalent to the insulating resin layers and the copper foils would form into wiring patterns.

The prepreg is comprised of a porous substrate and an organic resin (col 2 L 29-30). The organic resin can be epoxy resin or bismaleimide triazine (col 2 L 43-46 & col 1 L 68).

The porous substrate is a polybutadiene material (col 2 L 10-12). The porous material impregnated with epoxy resin would give a dielectric constant of 3.0 or less, if impregnated with bismaleimide triazine would give a dielectric constant of 3.2 or higher (col 2 L 8-14 & col 1 L 68-col 2 L 2). The prepreg material has a dielectric loss tangent of below 10^{-4} (col 1 L 35-36).

The multilayer printed wiring board is made by laminating prepreps and copper sheets repeatedly. Then a device or an IC chip is mounted on the surface of the multilayer printed wiring board (col 6 L 18-24).

The examiner takes the position that the copper sheets formed wiring patterns which are embedded within the prepreg layers and that the copper foil on the outer surface forms a wiring pattern that connects to the embedded wiring patterns as well as the surface device.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1775

7. Claims 1-6 and 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zussman (US 4601944) in view of Berger et al (US 6528145) further in view of Hayashi (US 6359235) and Farquhar et al (US 6764748).

Zussman teaches the present invention but is silent about the water absorption of the insulating resin layer is equal to or less than 0.1%.

Berger discloses a multilayer printed circuit board which is used for mounting semiconductor devices (col 1 L 18-19).

The printed circuit boards are made of insulating layers such as glass filled BT/epoxy resins or ceramic filled liquid crystalline polymer, and wiring patterns are sandwiched between the insulating layers (col 5 L 41-42, L 45-46, L 65 & col 1 L 19-22, L 38-41).

The polymeric material has a dielectric constant of less than 3.5 and a moisture absorption rate of less than 1 % (col 5 L 29-33 & col 6 L 42).

The examiner takes the position that Berger's multilayer circuit board has the wiring patterns embedded within the insulating layers and having an exposed conductive surface (34) for electrical connection with a semiconductor device (col 12 L 44-46 & Fig. 3).

Hayashi and Farquhar both teach a structure of a multilayer printed wiring board with conductive patterns embedded within the insulating layers.

Hayashi's printed wiring board is coupled with a semiconductor device (col 5 L 64-66). The insulating layers are dielectric materials such as epoxy resin or bismaleimide triazine, etc. (col 4 L 59-67).

Art Unit: 1775

Farquhar chooses liquid crystal polymer material as the insulating layers for the multilayer printed circuit board (col 1 L 22-44).

In view of the prior art teachings, one skill in the art would choose either epoxy resin, bismaleimide triazine resin or liquid crystal polymer as dielectric material in making printed circuit boards because these resinous material are well known to possess better electrical properties, better moisture resistance, better dimensional stability and low cost, etc. benefits (see Hayashi, col 4 L 63-65 and Farquhar, col 3 L 43-45).

Conclusion


8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTOL 892 form for the list.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (571) 272-1538. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1775

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Cathy Lam
Primary Examiner
Art Unit 1775

cfl
August 31, 2005